A novel sampling consensus algorithm motivated by RANSAC, but able to handle multiple instances of a structure in a dataset was developed. It is unsupervised, and discovers instances simultaneously rather than trying to find a structure, remove, and repeat. This approach is called L-SAC, for Labeled SAMpling Consensus. The algorithm randomly samples from a dataset and creates a descriptor vector to describe a unique instance of a structure found. It then creates a unique 1-dimensional label to attach to each candidate, reducing the search to a 1-dimensional clustering problem. The labels are designed to widen cluster boundaries. Therefore rather than relying on modes to build in the distribution from several similar structures discovered, unique instances can be found with only 1 structure instantiated by analyzing the boundaries. The technique allows for the development of a novel "compressed" sampling method. This procedure was applied it to the trivial case of lines, a case of finding planes and homographies using 2 image pairs, and finding multiple human faces using depth images provided by the Xbox Kinect.

Major: MSEE

Educational Career:
Bachelor's of Electrical Engineering, BS, 2002, University of Central Florida
Master's of Electrical Engineering, MS, 2011, University of Central Florida

Committee in Charge:
Dr. Hassan Foroosh, Chair, College of Electrical Engineering and Computer Science
Dr. Charles E. Hughes, College of Electrical Engineering and Computer Science
Dr. Marshall Tappen, College of Electrical Engineering and Computer Science

Approved for distribution by Dr. Hassan Foroosh, Committee Chair, on May 24, 2011.

The public is welcome to attend.